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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/597,892

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EXAMINER

LETTMAN, BRYAN MATTHEW

ART UNIT

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3746

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/597,892	Applicant(s) KALLESOE, CARSTEN	
	Examiner Bryan Lettman	Art Unit 3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6,8-18 and 21-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6,12,14,15,18 and 21-24 is/are rejected.
- 7) ☒ Claim(s) 8-11,13,16,17 and 25 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 August 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20101214</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The amendment filed December 14, 2010 has been entered. Claims 1-6, 8-18 and 21-25 remain pending in the application. The previous objections to the specification and drawings are withdrawn in light of Applicant's amendment to the specification and drawings. The previous 35 USC 112 rejections of claims 1-17 are withdrawn in light of Applicant's amendment to claims 1, 2, 8, 9, 16 and 21. The previous 35 USC 101 rejections of claims 1-13 and 15-22 are withdrawn in light of Applicant's amendment to claims 1 and 18.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is unclear what is meant by "when the presence of a fault is determined, one further determines as to which fault it is a case of". It is unclear if "a fault" is "an error signal", "a faulty function of the pump" or something else. The Examiner notes that in further interpreting the claims, it is assumed that what is meant is "after generating the error signal, determining what faulty function of the pump caused the generating of the error signal." Appropriate correction is required.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant

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regards as the invention. It is unclear if “the type of fault” is “the type of error signal”, “the type of faulty function of the pump” or something else. The Examiner notes that in further interpreting the claims, it is assumed that what is meant is “the type of faulty function of the pump that caused the generating of the error signal.” Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 12, 14, 15, 18 and 21-24 are rejected under 35 U.S.C. 102(b) as being anticipated by WIPO Publication 01/72352 to Medvedev.

Referring to claim 1, Medvedev discloses a method of determining pump faults comprising the steps of:

providing a pump assembly (10) with a pump motor (12) with at least two electrical variables (current I and voltage V) of the motor determining the electrical power of the motor (12) (shown in equation 5), and the pump (10) having at least one changing hydraulic variable of the pump (flow Q, shown in equation 4, pressure P_{norm} , shown in equation 3);

providing an electrical detection means (this is an inherent feature of the pump disclosed by Medvedev; page 7, lines 30-34) for detecting the electrical variables (I, V) of the motor (12);

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providing a hydraulic detection means (the sensed I and V) for detecting the changing hydraulic variable (Q and P_{norm}) of the pump;

detecting the electrical variables (I , V) of the motor with the electrical detection means (this is an inherent feature of the pump disclosed by Medvedev; page 7, lines 30-34);

detecting the hydraulic variable (Q and P_{norm}) of the pump with the hydraulic detection means (this is an inherent feature of the pump disclosed by Medvedev; page 7, lines 30-34);

providing a mathematical electrical motor model (equation 5) for generating a motor value (power S_{elec}) from a mathematical linking of the detected electrical variables (I , V) of the motor (12);

generating the motor value (S_{elec}) by input of the detected electrical variables (I , V) of the motor into the mathematical electrical motor model (equation 5);

providing a mathematical mechanical-hydraulic pump model for generating a pump comparison value from a mathematical linking of the motor value and the detected hydraulic variable of the pump (10) (page 7, line 35 – page 8, line 8);

generating the pump comparison value by input of the motor value (S_{elec}) and the detected hydraulic variable (Q and P_{norm}) of the pump (10) into the mathematical mechanical-hydraulic pump model (page 7, line 35 – page 8, line 8);

providing a predefined pump value (Q_{target} , shown in equations 1 and 2);

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comparing the pump comparison value to the predefined pump value to detect agreement or a difference between the pump comparison value and the predefined pump value (page 8, line 8 – page 9 line 25); and

generating an error signal (a pump shutdown signal) upon detecting a difference between the pump comparison value and the predefined pump value beyond a certain measure to indicate a faulty function of the pump (10) (page 8, line 8 – page 9 line 25).

Referring to claim 2, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

the two electrical variables (I , V) of the motor (12) which determine the electrical power value (S_{elec}) of the motor (12), are the voltage prevailing at the motor and the current feeding the motor (see equation 5).

Referring to claim 3, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

after generating the error signal, determining what faulty function of the pump caused the generating of the error signal (page 7, line 35 – page 9 line 25).

Referring to claim 4, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

the detected hydraulic variable is the pressure produced by the pump (see equation 3).

Referring to claim 5, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

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the detected hydraulic variable is the delivery quantity of the pump (see equation 4).

Referring to claim 6, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

the detected hydraulic variable is the differential pressure between the suction side and the pressure side of the pump (page 5, lines 24-34).

Referring to claim 12, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

for determining the type of faulty function of the pump (10) that caused the generating of the error signal, additionally to the two electrical variables (I , V), two hydraulic variables (Q and P_{norm}) are determined, preferably by way of measurement (by measurement of ω , I and V), and the determined values or values derived therefrom are compared to predefined values, wherein the predefined values in each case define a surface, wherein one determines whether the determined variables or those derived therefrom lie on one of these surfaces (r^*1 - r^*4) or not, and the type of fault is determined by way of the combination of the fault variables and by way of predefined boundary value combinations (page 7, line 35 – page 9, line 25).

Referring to claim 14, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

on determining a fault (such as incorrect flow), the pump assembly is activated with a changed rotational speed (by way of changing the supply I), in order by way of

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the measurement results which then set in, to more accurately specify the determined fault (page 8, line 8 – page 9 line 25).

Referring to claim 15, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

the mechanical- hydraulic pump/motor model also includes at least parts of the hydraulic system affected by the pump, in a manner such that faults of the hydraulic system may also be determined (page 7, line 30 – page 9 line 25).

Referring to claim 18, Medvedev discloses a device of determining pump faults comprising:

a pump motor (12) with at least two electrical variables (current I and voltage V) of the motor determining the electrical power of the motor (12) (shown in equation 5), the pump assembly (10) having at least one changing hydraulic variable (flow Q , shown in equation 4, pressure P_{norm} , shown in equation 3);

an electrical detection means (this is an inherent feature of the pump disclosed by Medvedev; page 7, lines 30-34) for detecting the two electrical variables (I , V) of the motor (12);

a hydraulic detection means (the sensed I and V) for detecting the changing hydraulic variable (Q and P_{norm}) of the pump;

an evaluation means which determines a fault condition of the pump assembly by way of the detected variables, the evaluation means comprising:

providing a mathematical electrical motor model (equation 5) for generating a motor value (power S_{elec}) from a mathematical linking of the detected electrical variables (I , V) of the motor (12);

generating the motor value (S_{elec}) by input of the detected electrical variables (I , V) of the motor into the mathematical electrical motor model (equation 5);

providing a mathematical mechanical-hydraulic pump model for generating a pump comparison value from a mathematical linking of the motor value and the detected hydraulic variable of the pump (10) (page 7, line 35 – page 8, line 8);

generating the pump comparison value by input of the motor value (S_{elec}) and the detected hydraulic variable (Q and P_{norm}) of the pump (10) into the mathematical mechanical-hydraulic pump model (page 7, line 35 – page 8, line 8);

providing a predefined pump value (Q_{target} , shown in equations 1 and 2);

comparing the pump comparison value to the predefined pump value to detect agreement or a difference between the pump comparison value and the predefined pump value (page 8, line 8 – page 9 line 25); and

generating an error signal (a pump shutdown signal) upon detecting a difference between the pump comparison value and the predefined pump value beyond a certain measure to indicate a faulty function of the pump (10) (page 8, line 8 – page 9 line 25).

Referring to claim 21, Medvedev further discloses a device of determining pump faults wherein:

the device is an integral component of the pump electronics of the pump (this is inherent since the disclosed pump is a self contained device).

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Referring to claim 22, Medvedev further discloses a device of determining pump faults wherein:

means are provided to produce and transmit at least one fault notification (page 7, lines 16-18; page 8, lines 21-23; wherein the microprocessor 18 sends a fault signal to the motor winding commutation circuit 16 to cause a change in the power supplied by power supply 14).

Referring to claim 23, Medvedev discloses a method of determining pump faults comprising the steps of:

acquiring at least two electrical variables (current I and voltage V) of the motor of the pump assembly (10), which electrical variables determine the electrical power of the motor (12) (shown in equation 5), and acquiring at least one changing hydraulic variable of the pump (flow Q , shown in equation 4, pressure P_{norm} , shown in equation 3) and acquiring at least one further mechanical variable (frequency) which determines the power of the pump (the frequency provides the time interval used with equation 5);

mathematically linking the two detected electrical variables (I , V) the motor (12) which determine the electrical power of the motor for providing a comparison or value (power S_{elec}) (equation 5);

mathematically linking the changing hydraulic variable of the pump (10), as well as the at least one further mechanical variable determining the power of the pump for providing a pump comparison value, wherein a mathematical electrical motor model (equation 5) is used with a mathematical mechanical-hydraulic pump model/ motor model for the mathematical linking steps (page 7, line 35 – page 8, line 8);

comparing the results of the mathematical linking steps with a predefined pump value (Q_{target} , shown in equations 1 and 2); and

generating an error signal (a pump shutdown signal) upon detecting a difference between the results of the mathematical linking steps and the predefined pump value, which difference is beyond a certain measure, to indicate a faulty function of the pump (10) (page 8, line 8 – page 9 line 25).

Referring to claim 24, Medvedev further discloses a method of determining pump faults comprising the steps wherein:

voltage prevailing at the motor and the current feeding the motor (see equation 5) are the two electrical variables (I , V) of the motor (12) which determine the electrical power value (S_{elec}) of the motor (12) and the acquired hydraulic variable is the pressure produced by the pump (see equation 3).

Allowable Subject Matter

Claims 8-11, 13, 16-17 and 25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

Applicant's arguments filed December 14, 2010 have been fully considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bryan Lettman whose telephone number is (571) 270-7860. The examiner can normally be reached on Monday - Thursday between 9:00 am and 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571) 272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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